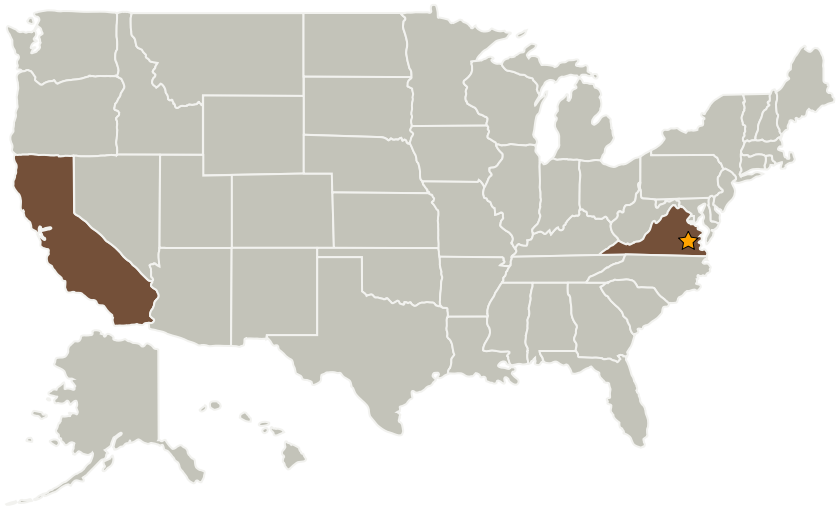
Ultrasensitive Mid-Infrared In Situ Spectrometer for Planetary Atmospheric Analysis, Phase I

Completed Technology Project (2004 - 2004)

Project Introduction

The Small Business Innovative Research Phase I proposal seeks to develop a compact, robust in situ spectrometer capable of detecting multiple gas-phase species in planetary atmospheres with ultra-high sensitivity and selectivity. This instrument will employ a novel room-temperature, widely tunable mid-infrared laser source in conjunction with cavity ringdown spectroscopy. During Phase I, the 3.3 to 3.5 μm spectral region will be targeted, which overlaps the spectral absorption features of variety of hydrocarbons, including methane, ethane, and formaldehyde. The ultra-high sensitivity of the proposed system will enable these species to be detected at concentrations below 7*107/cm3 per minute, which corresponds to a detection limit of <30 pptv in Earth?s atmosphere.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Novawave Technologies	Supporting Organization	Industry	Redwood City, California

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Joshua Paul

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.2 Atomic and Molecular Species Assessment